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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/536,747	05/27/2005	Hiroyuki Kitayama	03500.018035	4697

5514 7590 04/02/2007
FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

NELMS, DAVID C

ART UNIT	PAPER NUMBER
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2871

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/536,747	Applicant(s) KITAYAMA, HIROYUKI	
	Examiner Matthew Tynan	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/27/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/27/05 and 10/4/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 10/4/2006 and 5/27/2005 were filed after the mailing date of the instant application on 5/27/2005. The submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikeda et al. (U.S. Pub. No. 2003/0048521) with supporting evidence from Ito et al. (U.S. Patent No. 2006/0056008) and Etori (U.S. Pub. No. 2005/0243561).
5. Regarding claim 1, Ikeda et al. teaches a display device comprising:
 - A display substrate (1, Fig. 9) and a rear substrate (2).
 - A transparent liquid disposed in the space between these substrates.
 - A partition wall (3) formed from a material capable of transmitting light ([0065]).

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- A light shielding layer disposed between the partition wall and the rear substrate ([0095], lines 1-3, "black color layer").
- A light scattering layer ([0094]) disposed on the rear substrate.
- The refractive index of the partition wall ([0065], line 5 teaches the wall may be made of acrylic resin ($n \approx 1.5$); other materials suggested include PET ($n \approx 1.6$), polycarbonate ($n \approx 1.6$), PES ($n \approx 1.65$), quartz ($n \approx 1.54$) and glass ($n \approx 1.5$)) is no less than that of the transparent liquid ([0095], lines 5-6, specify isoparaffin, $n \approx 1.48$) and an incident light ray on the display substrate at a predetermined angle is not totally reflected but refracted into the transparent liquid at a side face of the partition wall.

6. Ito et al. teaches that isoparaffin, or ISOPAR, has an index of refraction of 1.48 (paragraph [0161]). Etori teaches the index of refraction of ordinary acrylic resin is 1.5 (paragraphs [0049] and [0055]).

7. Therefore, claim 1 is unpatentable.

8. Regarding claim 2, the device taught by Ikeda et al. has $n(K) = 1.5$ and $n(L) = 1.48$ which satisfy $90 - \text{Arcsin}[1/2n(K)] < \text{Arcsin}[n(L)/n(K)]$. Specifically, inserting the values for $n(K)$ and $n(L)$, the left side gives 70.5 degrees while the right side gives 80.6 degrees. The limitation of claim 2 is thus satisfied.

9. Therefore, claim 2 is unpatentable.

10. Regarding claim 3, Ikeda et al. teaches $H = 20$ microns, $W = 8$ microns ([0090], lines 4-5). Therefore, $\alpha = 21.8$ degrees. Again, $n(K) = 1.5$, $n(L) = 1.48$. $90 - \text{Arcsin}[n(K) \cdot \sin(\alpha)] = 56.1$ degrees. This is less than $\text{Arcsin}[n(L)/n(K)] = 80.6$ degrees.

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11. Therefore, claim 3 is unpatentable.
12. Regarding claim 4, Ikeda et al. teaches the partition wall is formed of acryl ([0065], lines 1-5).
13. Therefore, claim 4 is unpatentable.
14. Regarding claim 5, Ikeda et al. teaches the transparent liquid contains a plurality of charged particles ([0095], line 4).
15. Therefore, claim 5 is unpatentable.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. (U.S. Pub. No. 2003/0048521) with evidence from Ito et al. (U.S. Patent No. 2006/0056008) and Etori (U.S. Pub. No. 2005/0243561) in view of Somiyody (U.S. Patent No. 4,305,807) and Yamada et al. (U.S. Patent No. 5,668,651).
18. Ikeda et al. has been discussed above regarding claim 1. Regarding claim 6, Ikeda et al. does not teach the transparent liquid is a liquid crystal.
19. However, Somiyody teaches that using liquid crystal in an electrophoretic display provides superior threshold characteristics and enables the creation of an improved matrix display (Abstract).

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20. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electrophoretic device taught by Ikeda et al. using the liquid crystal as the transparent liquid motivated by the ability of liquid crystal to provide superior threshold characteristics and enable the creation of an improved matrix display.

21. Yamada et al. teaches that the refractive indices of the liquid crystal material (20) should be matched closely to that of the polymer wall (18) in order to reduce light scattering at the interfaces between the liquid crystal and the polymer material (col. 15, lines 24-30).

22. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device taught by Ikeda et al. and Somiyody by choosing a partition wall material and liquid crystal such that the refractive index of the partition wall was no less than that of the liquid crystal in order to reduce light scattering at the interfaces between the liquid crystal and the polymer material.

23. Therefore, claim 6 is unpatentable.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Tynan whose telephone number is 571-270-1433. The examiner can normally be reached on Mon-Fri. 7:30-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MT


ANDREW SCHECHTER
PRIMARY EXAMINER